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PATENT APPLICATION

ATTORNEY DOCKET NO. 200315686-1

IN THE
UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): Anand D. SANKRUTHI

Application No.: 10/760,348

Filing Date: January 21, 2004

Confirmation No.: 9775

Examiner: Ryan A. Dare

Group Art Unit: 2186

Title: VOLUME TYPE DETERMINATION FOR DISK VOLUMES MANAGED BY A LDM

Mail Stop Appeal Brief-Patents
Commissioner For Patents
PO Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL OF APPEAL BRIEF

Transmitted herewith is the Appeal Brief in this application with respect to the Notice of Appeal filed on November 13, 2006 .

The fee for filing this Appeal Brief is (37 CFR 1.17(c)) $500.00.

(complete (a) or (b) as applicable)

The proceedings herein are for a patent application and the provisions of 37 CFR 1.136(a) apply.

☐ (a) Applicant petitions for an extension of time under 37 CFR 1.136 (fees: 37 CFR 1.17(a)-(d)) for the total number of months checked below:

☐ 1st Month $120	☐ 2nd Month $450	☐ 3rd Month $1020	☐ 4th Month $1590

☐ The extension fee has already been filed in this application.

☒ (b) Applicant believes that no extension of time is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition and fee for extension of time.

Please charge to Deposit Account 08-2025 the sum of $ 500 . At any time during the pendency of this application, please charge any fees required or credit any over payment to Deposit Account 08-2025 pursuant to 37 CFR 1.25. Additionally please charge any fees to Deposit Account 08-2025 under 37 CFR 1.16 through 1.21 inclusive, and any other sections in Title 37 of the Code of Federal Regulations that may regulate fees. A duplicate copy of this sheet is enclosed.

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Respectfully submitted,

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Applicant:	Anand D. SANKRUTHI
Title:	VOLUME TYPE DETERMINATION FOR DISK VOLUMES MANAGED BY A LDM
Application No.	10/760,348
Filing Date:	1/21/2004
Examiner:	Ryan A. Dare
Art Unit:	2186
Confirmation No.:	9775

APPEAL BRIEF UNDER 37 C.F.R. § 41.37

MAIL STOP APPEAL BRIEF - PATENTS
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Under the provisions of 37 C.F.R. § 41.37, this Appeal Brief is being filed together with a credit card payment form in the amount of $500.00 covering the 37 C.F.R. 41.20(b)(2) appeal fee. If this fee is deemed to be insufficient, authorization is hereby given to charge any deficiency (or credit any balance) to the undersigned deposit account 19-0741.

1. REAL PARTY IN INTEREST

The real party in interest is Hewlett-Packard Company.

2. RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences known to Appellants, the Appellants' legal representative, or assignee which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

3. STATUS OF CLAIMS

The present appeal is directed to claims 1-16 which are the claims under consideration. A copy of the pending claims 1-16 are attached herein in the Claims Appendix (Section 8).

Claims 1-8, 13, 15, and 16 are finally rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent Application Publication No. 2003/0023811 ("Kim").

Claim 9 is finally rejected under 35 U.S.C. § 103(a) as being unpatentable over Kim as applied to claims 1-6, 8, 13, 15 and 16 and further in view of U.S. Patent No. 6,611,896 ("Mason").

Claims 10-12 and 14 are finally rejected under 35 U.S.C. § 103(a) as being unpatentable over Kim as applied to claims 1-6, 8, 13, 15 and 16 and further in view of U.S. Patent No. 6,553,387 ("Cabrera").

4. STATUS OF AMENDMENTS

Claims 1-16 were initially pending in the application filed on January 21, 2004.

Claims 1-3, 5-8, 12, 13 and 16 were amended in an Amendment and Reply filed on May 24, 2006, in reply to an initial Office Action mailed on February 24, 2006.

A Notice of Appeal was filed on November 10, 2006, appealing a final Office Action mailed on August 10, 2006.

This Appeal Brief is being filed within the statutory two month period after the filing of the Notice of Appeal on November 10, 2006.

5. SUMMARY OF CLAIMED SUBJECT MATTER

Independent claims 1, 12, and 13 recite a system and method of determining volume types present on a storage device, the method including the steps of determining superficial specifying characteristics of a volume on the storage device and correlating the superficial specifying characteristics against one or more previously determined volume characteristics thereby inferring a method used for writing data onto the volume.

Line 27 on page 8 – line 10 on page 9 of the application describe the step of determining superficial specifying characteristics of a volume on a storage device. These characteristics are stored by the claimed system in memory. (*See* Page 5, lines 7-8.) The application further discloses that a processor correlates the superficial specifying characteristics against one or more previously determined volume characteristics to infer a method used for writing data onto the volume. (*See* Page 5, lines 9-12; Page 9, lines 11-18.)

Lines 17- 21 on page 8 of the application describe the step of determining if a symbolic name of a volume contains information identifying the volume type as either "raid" or "striped." The step of indicating that the volume type is "raid" or "striped" is discussed on line 27, page 8 – line 3, page 9. The steps of determining a size of storage unit extents occupied by the volume and the actual size of the volume, determining if the sum of the storage unit extents is greater than the actual size of the volume thereby indicating that the volume type is "mirrored", determining if all of the storage unit extents lie on the same storage unit thereby indicating that the volume type is "simple" and determining if all the storage unit extents do not lie on the same storage unit and that the sum of the storage unit extents is not greater than the actual size of the volume, thereby indicating that the volume type is "spanned" is disclosed for example on page 9, lines 11-18 of the application.

6. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The issue on appeal is whether the examiner erred in:

finally rejecting claims 1-8, 13, 15, and 16 under 35 U.S.C. §102(e) as being anticipated by U.S. Patent Publication No. 2003/0023811 ("Kim");

finally rejecting claim 9 under 35 U.S.C. § 103(a) as being unpatentable over Kim as applied to claims 1-6, 8, 13, 15, and 16 and further in view U.S. Patent No. 6,611,896 ("Mason, Jr."); and

finally rejecting claims 10-12 and 14 under 35 U.S.C. § 103(a) as being unpatentable over Kim as applied to claims 1-6, 8, 13, 15, and 16 and further in view of U.S. Patent No. 6,553,387 ("Cabrera").

7. ARGUMENT

It is respectfully submitted that the applied rejections of the pending claims are erroneous for at least the following reasons.

Claim Rejections under 35 U.S.C. § 102

Applicant relies on M.P.E.P. § 2131, entitled "Anticipation – Application of 35 U.S.C. § 102(a), (b) and (e)" which states, " a claim is anticipated only if each and every element set forth in the claim is found, either expressly or inherently described, in a single prior art reference." Applicant respectfully submits that Kim does not describe each and every element of independent claims 1 and 13 as amended.

Claim 1 is directed to a method of determining volume types present on a storage device. The claimed method includes the steps of "determining superficial specifying characteristics of a volume on the storage device and correlating the superficial specifying characteristics against one or more previously determined volume characteristics thereby inferring a method used for writing data onto the volume." Thus, for each volume present on a storage device, the present invention identifies the way in which data was written onto each

volume by inference. That is, a key innovation of the claimed method is that it correlates the superficial specifying characteristics of a volume against one or more previously determined volume characteristics to determine how data was written to the volume. For example, the present invention can determine whether a volume's storage is implemented using RAID, mirrored, stripe, spanned or simple storage mechanisms. One advantage of the claimed invention is that the method used for writing data onto the volume is deduced indirectly, thus obviating the need to access and interpret a Logical Disk Manager (LDM) volume.

In contrast Kim is directed to a method for managing a logical volume. Kim's disclosed method includes the steps of creating a logical volume and generating metadata including information of the logical volume and the disk partitions participating to the logical volume and storing it to the disk partitions participating to the logical volume. (*See* ¶ [0038].) Kim discloses that a computer system utilizing the present invention includes a Logical Volume Manager 30 or a Logical Disk Manager. (*See* ¶ [0068].) Kim discloses that the logical volume is constructed with several disk partitions and the logical volume manager records the metadata about the volume construction in corresponding disk partitions. (*See* ¶¶ [0081] and [0082].) The metadata stored by and accessible through the Logical Volume Manager includes a physical partition map 71 and a logical volume map 72, shown in FIGs. 3-5. (*See* ¶ [0084].)

The Final Office Action asserts that the metadata maps described above is a superficial specifying characteristic of a logical volume. Further, the Final Office Action asserts that the raid level 98 shown in Figure 5 is a method for writing to a volume. However, Kim does not disclose, teach or suggest correlating the superficial specifying characteristics against one or more previously determined volume characteristics thereby inferring a method used for writing data onto the volume as claimed in independent claims 1 and 13. Instead, as illustrated in FIGs. 10 and 11, in order to determine the raid level 98 of a logical volume the logical volume map, stored in a disk partition, is read directly. (*See* ¶ [0125].) No correlation or inference is made by the method taught in Kim. Accordingly, it is clear that Kim teaches that the raid level is obtained by accessing the volume created by Logical Volume Manager. Further, paragraph [0125] does not disclose, teach or suggest that the superficial specifying

characteristics are correlated against previously determined volume characteristics to infer the method used for writing data onto the volume as claimed in independent claims 1 and 13. Accordingly, Applicant respectfully requests reconsideration and that the rejection of claims 1 and 13 be withdrawn.

In addition, dependent claims 2-11 and 14-16 depend from one of claims 1 and 13 and should therefore be allowed without regards to further patentable limitations contained therein.

Claim Rejections under 35 U.S.C. § 103

As set forth above, Applicant respectfully submits that Kim does not disclose, teach or suggest each and every limitation of independent claims 1 and 13. Specifically, Kim does not disclose a method for determining volume types present on a storage device including the step of correlating the superficial specifying characteristics against one or more previously determined volume characteristics thereby inferring a method used for writing data onto the volume. Dependent claims 9-11 and 14 depend from one of independent claims 1 or 13 and are therefore allowable. Further, Mason and Cabrera fail to cure the deficiencies of Kim. Accordingly, Applicant respectfully requests reconsideration and that the rejection of claims 9-11 and 14 be withdrawn.

Concerning claim 12, Applicant respectfully traverses the rejection as set forth below. Applicant relies on M.P.E.P. § 2143, which states that to establish a prima facie case of obviousness, three basic criteria must be met. First there must be some suggestion or motivation in the prior art to modify the reference. Second, there must be a reasonable expectation of success. Third, the prior art must teach or suggest all the claim limitations.

Applicant submits that Kim in combination with Cabrera et al. do not teach, disclose or suggest each and every element as set forth in claim 12. As set forth above, Kim's disclosed method includes the steps of creating a logical volume and generating metadata including information of the logical volume and the disk partitions participating to the logical volume and storing it to the disk partitions participating to the logical volume. (*See* ¶ [0038].)

In the Office Action, the Examiner asserts that paragraph [0102] anticipates indicating whether a volume is RAID or striped. Applicant respectfully disagrees. As explained in paragraph [0102], FIG. 5 is a logical volume map containing a stripe size and raid level. That is, the volumes taught in Kim have both a stripe size and a raid level. Kim identifies a volume by header, volume ID and volume name. (*See* FIG. 5.) However, Kim does not disclose, teach or suggest "identifying the volume type as either "raid" or "striped" as claimed in claim 12. Thus, Kim does not disclose each and every element of the invention as claimed in claim 12. Further, Cabrera et al. fails to cure the deficiencies of Black. Accordingly, Applicant respectfully submits that claim 12 is allowable and respectfully requests that the rejection be withdrawn.

CONCLUSION

In view of above, appellants respectfully solicit the Honorable Board of Patent Appeals and Interferences to reverse the rejections of the pending claims and pass this application on to allowance.

At any time during the pendency of this application, please charge any fees required or credit any over payment to Deposit Account 08-2025 pursuant to 37 C.F.R. § 1.25. Additionally, charge any fees to Deposit Account 08-2025 under 37 C.F.R. § 1.16 through § 1.21 inclusive, and any other sections in Title 37 of the Code of Federal Regulations that may regulate fees.

Respectfully submitted,

Date January 11, 2007

By _____

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8. CLAIMS APPENDIX

LIST OF THE PENDING CLAIMS (WITH STATUS IDENTIFIERS)

1. (Previously Presented) A method of determining volume types present on a storage device, the method including the steps of determining superficial specifying characteristics of a volume on the storage device and correlating the superficial specifying characteristics against one or more previously determined volume characteristics thereby inferring a method used for writing data onto the volume.

2. (Previously Presented) A method as claimed in claim 1, wherein one of the storage device comprises one or more data storage units.

3. (Previously Presented) A method as claimed in claim 2, wherein the one or more data storage units corresponds to a disk or drive and/or is logical or physical.

4. (Original) A method as claimed in claim 3, wherein the storage device comprises a disk, array of disks or similar assembly of partitionable media.

5. (Previously Presented) A method as claimed in claim 1, wherein the specifying characteristics include identifying strings embedded in a symbolic name of the volume.

6. (Previously Presented) A method as claimed in claim 1, wherein the specifying characteristics further include characteristics related to how the volume is physically arranged in the storage device.

7. (Previously Presented) A method as claimed in claim 6, wherein the physical arrangement of the volume on the storage device include criteria corresponding to the size of the storage unit extents of the volume in relation to the actual size of the volume.

8. (Previously Presented) A method as claimed in claim 1, wherein RAID and striped volume types are identified by corresponding strings present in a symbolic volume name.

9. (Original) A method as claimed in claim 1 wherein, if the volume is not previously identified as a RAID volume, the characteristic of the sum of the storage unit extents occupied by the volume being greater than the actual size of the volume corresponds to a mirrored volume type.

10. (Original) A method as claimed in claim 1, wherein the characteristic of the storage unit extents occupied by the volume being on the same storage unit corresponds to a simple volume type.

11. (Original) A method as claimed in claim 1, wherein if the volume is not previously identified as a RAID volume, the characteristic of neither the sum of the storage unit extents occupied by the volume being greater than the actual size of the volume nor the storage unit extents occupied by the volume being on the same storage device, corresponds to a spanned volume type.

12. (Previously Presented) A method of determining volume types present on a disk, the method including the steps of:

determining if a symbolic name of a volume contains information identifying the volume type as either "raid" or "striped" thereby indicating that the volume type is "raid" or "striped" respectively;

determining a size of storage unit extents occupied by the volume and the actual size of the volume;

determining if the sum of the storage unit extents is greater than the actual size of the volume thereby indicating that the volume type is "mirrored";

determining if all of the storage unit extents lie on the same storage unit thereby indicating that the volume type is "simple";

and, determining if all the storage unit extents do not lie on the same storage unit and that the sum of the storage unit extents is not greater than the actual size of the volume, thereby indicating that the volume type is "spanned".

13. (Previously Presented) A system for managing volumes on storage devices including:

memory which stores specifying characteristics corresponding to one or more volume types;

a processor arranged to determine characteristics of volumes occupying storage devices which are present on the system and to correlate the determined characteristics against the specifying characteristics thereby inferring a method used for writing data onto the volumes.

14. (Original) A system as claimed in claim 13, wherein the inference step includes extracting the symbolic name of the volume and if it includes the string RAID or striped, correlating that with the RAID and striped volume types respectively, and otherwise analysing the size of the storage unit extents occupied by the volume and if the sum of the storage unit extents is more than the actual size of the volume correlating that with a mirrored volume type, if the storage unit extents occupied by the volume all reside on the same storage unit, correlating that with a simple volume type and if none of the abovementioned criteria are met, correlating this with a spanned volume type.

15. (Original) A computer adapted to operate in accordance with claim 1.

16. (Previously Presented) A computer program module embodied on a computer readable medium, adapted to function in accordance with claim 1.

9. EVIDENCE APPENDIX

None.

10. RELATED PROCEEDINGS APPENDIX

None.